

were rehospitalized within the past year (up to five admissions). Rehospitalizations were classified according to the Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project classification (18 categories). In the present analyses, TBI severity was classified by duration of posttraumatic amnesia (PTA; 0-1 days=mild, 2+ days=moderate-severe). Statistical analyses were conducted in SPSS.

Results: Participants (N=1101; n=338 0-1 days PTA, n=513 2+ days PTA, n=250 no PTA data) ranged in age from 17 years to 91 years at the time of interview. Participants across all follow up timepoints reported 317 rehospitalizations in the past year. 19.45% of Year 1 participants, 24.37% of Year 2 participants, 16.19% of Year 5 participants, and 16.25% of Year 10 participants reported 1+ rehospitalizations in the past year. When controlling for age, participants with at least 2 days of PTA were more likely to be rehospitalized at least once compared to those with 0-1 days of PTA at Year 2 (OR=4.05, $p<0.001$) and Year 5 (OR=2.39, $p=0.03$) post-TBI. The three most common reasons for rehospitalization across all timepoints were injury and poisoning (17.3%), mental illness (16.7%), and diseases of the nervous system and sense organs (9.1%). Mental illness was the modal reason for rehospitalization at Years 2, 5, and 10, frequently due to substance- or alcohol-related disorders and suicide/intentional self-inflicted injury.

Conclusions: Compared to prior research, rates of rehospitalization were lower in this sample across follow-up time points. The inclusion of mild TBI in this analysis may partially explain the discrepancy. Importantly, two of the top three rehospitalization reasons are potentially preventable, and strategies to reduce risk of re-injury and minimize escalation of psychiatric distress should therefore be explored. Psychoeducation, supervision, and mental health support during the transition from hospital to community should be considered in order mitigate preventable causes of rehospitalization among long-term TBI survivors.

Categories: Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Adult)

Keyword 1: traumatic brain injury

Keyword 2: brain injury

Correspondence: Michelle E. Fox, Ph.D.; James A. Haley Veterans' Hospital, Tampa, Florida; michelle.fox@va.gov

24 Poststroke Depression in Patients with Infratentorial Stroke Undergoing Acute Inpatient Stroke Rehabilitation

Rachel Waldman, Abhishek Jaywant
Weill Cornell Medicine, New York, NY, USA

Objective: Poststroke depression is common in those with stroke and is associated with worse functional outcomes, recurrence of stroke, and increased mortality. Poststroke depression has been most commonly associated with lesions of the frontal lobe and anterior regions of the brain, in addition to lesions in subcortical structures. Yet, there is also evidence that indicates the presence of depressive symptoms in those with infratentorial (including brainstem, pontine, and cerebellar) stroke, which may be mediated by alternative pathophysiologic mechanisms. Patients undergoing acute inpatient stroke rehabilitation may present with depressive symptoms that go unassessed or untreated throughout their recovery, including those with infratentorial stroke. The current objective was to evaluate the degree of depressive symptoms in patients with infratentorial stroke compared to those with supratentorial stroke.

Participants and Methods: Participants were admitted to an acute inpatient rehabilitation unit for stroke rehabilitation. Participants were enrolled in an ongoing clinical trial. Participants with recent infratentorial stroke (N = 7; 4 female; Median age = 69 years; Median education = 16 years) were administered the Patient Health Questionnaire-9 (PHQ-9) to assess symptoms of depression. Severity of depressive symptoms (PHQ-9 total score) in participants with infratentorial stroke was compared to those with supratentorial stroke (N = 19; 10 female; Median age = 69 years; Median education = 15 years) through Mann-Whitney U tests.

Results: Participants with infratentorial stroke endorsed similar levels of depression to those with supratentorial stroke. Participants with infratentorial stroke endorsed overall mild depressive symptoms (Mean PHQ-9 score = 7.29; Median = 7), similar to those with supratentorial stroke (Mean PHQ-9 score = 7.11; Median = 6). Significant differences in depressive symptoms were not observed between participants with infratentorial and supratentorial stroke ($p = .785$).

Conclusions: Patients with infratentorial and supratentorial stroke may experience a similar degree of poststroke depression. Despite differences in suspected pathophysiologic mechanisms, infratentorial and supratentorial stroke appear to influence depressive symptoms to a similar extent. While future analyses with larger sample sizes are indicated, the current study indicates that patients with infratentorial and supratentorial stroke should be evaluated for depressive symptoms during the acute phases of recovery to inform treatment and potentially improve outcomes.

Categories: Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Adult)

Keyword 1: depression

Keyword 2: stroke

Correspondence: Rachel Waldman, PsyD, Weill Cornell Medicine, rew4001@med.cornell.edu

25 Associations between Diffusion Kurtosis Imaging, Tau, and Cognitive Outcomes in TBI

Robert D Claar¹, Aditi Venkatesh¹, Richard Rubenstein², Kevin Wang¹, Amy Wagner³, Claudia Robertson⁴, Erin Trifilio¹, John Williamson¹, Damon Lamb¹

¹University of Florida, Gainesville, FL, USA.

²SUNY Downstate, Brooklyn, NY, USA.

³University of Pittsburgh, Pittsburgh, PA, USA.

⁴Baylor University, Waco, TX, USA

Objective: Determine associations between cognitive outcomes in remote TBI (i.e., at least 6 months post injury), a blood marker of neural degeneration (i.e., Tau), and diffusion kurtosis imaging (DKI) measures (e.g., mean or radial kurtosis). Because DKI imaging is sensitive to the environmental complexity of the imaged area, we sought to investigate regions known to be associated with the cognitive and emotional sequelae of TBI, such as the anterior thalamic radiations, uncinate fasciculus, and the corpus callosum.

Participants and Methods: 41 individuals with mild-to-moderate TBI and a mean age(SD) of 36.1(10.4) years underwent DKI, a blood draw, and neuropsychological assessments. 23 healthy controls (HC) with a mean age(SD) of

35.2(15.2) years underwent the blood draw and assessments, but no imaging. Higher diffusion kurtosis indicates more restricted diffusion, possibly due to greater complexity within the imaged region. Thus, in the context of TBI, DKI can be used as a proxy measurement for biological processes that alter the complexity of imaged environments, such as reactive gliosis. Some people show cognitive deficits long after TBI and this could be associated with increased inflammation and membrane protein aggregates in damaged brain regions. We used bivariate correlations and general linear models to investigate the association of mean kurtosis (MK) in long white matter tracts and Tau (total or phosphorylated) to color-word Stroop scores; a measure of fronto-subcortical function.

Results: In patients with TBI, MK was significantly associated with serum total Tau (TTau) in the right ($r=-0.396$) and left ($r=-0.555$) uncinate fasciculus (UF), right ($r=-0.402$) and left ($r=-0.504$) anterior thalamic radiations (ATR), and the genu ($r=-0.526$) and body ($r=-0.404$) of the corpus callosum (CC). TTau had a significant association with word Stroop scores, $F(1,63)=-2.546$, $p=0.013$. However, there was no significant effect of group (i.e., TBI or HC), $F(2,63)=-0.426$, $p=0.672$, on cognitive performance. When models were implemented that included both TTau and MK in either the UF or ATR as explanatory variables to predict word Stroop scores, TTau levels and MK in the right UF explained a significant amount of the variance in Stroop performance, $F(1,29)=2.215$, $p=0.025$. Further, there was also a significant association between radial kurtosis in the right UF and Stroop word scores ($r=0.366$).

Conclusions: Our results show that an indicator of biological complexity (DKI) in cognitively important brain regions is associated with cognitive performance and Tau in patients with remote mild-to-moderate TBI. The UF is a critical fronto-temporal/subcortical pathway that has previously been implicated in the manifestation of executive dysfunction and mood dysregulation in TBI. Tau is an important marker of neurodegeneration implicated in Alzheimer's disease, Parkinson's disease, and chronic traumatic encephalopathy (CTE), and DKI is potentially sensitive to markers of neurodegeneration. The association of Tau and DKI measures is novel and shows concordance between blood and brain imaging markers and cognitive performance in patients with mild to moderate TBI.